

REMARKS

Claims 1, 3-12 remain in the application.

The Office Action rejected claim 2 under 35 U.S.C. § 112 as lacking antecedent basis.

Claim 2 was canceled.

The Office Action rejected Claims 1, 3, 5-8, 11 and 12 under 35 U.S.C. § 103(a) as being unpatentable over *Walker (Neuroimaging and the Sleeping Brain*, hereinafter “*Walker*”).

Walker analyzes brain activity by stimulating the brain while the patient is asleep and while the patient is awake. It then uses an event-related fMRI and EEG acquisition paradigm to record and analyze the results to determine which auditory stimulus provides what level of activation to the brain. (¶¶4-5).

The present invention is a method and apparatus for analyzing brain functions which are capable of reducing the burden on an examinee as well as analyzing a function of a part of the brain which could not be easily analyzed. (Pg. 3) It accomplishes this by detecting biosignals such as electroencephalograph in parallel and separately from the examination conducted by an MRI system. (Pg. 3; Fig. 2) Parts of the brain that are functioning based on a correlation between the time-series data of the biosignal and a change in the MRI strength can then be analyzed. The examinee therefore does not have to perform any tasks and is only requested to sleep. (Pg. 3) This is particularly useful for examinees with a malady or disorder in his or her brain since the burden of examination for the examinee is reduced. (Pg. 4) Furthermore, the study of specific parts of the brain including the thalamus, putamen, and pons are now possible. This is important because these areas of the brains have been linked to memory processing which can possibly lead to diagnoses for disturbance of memory, Alzheimer’s, Parkinson’s disease, etc. (Pg. 5).

With respect to claim 1, *Walker* does not teach or suggest “biosignal detection means for detecting a biosignal that identifies a waking level of an examinee in parallel with examination of the brain of the examinee in a state without external stimuli conducted by an MRI System.” *Walker* does not examine the brain of the examinee “in a state without external stimuli.” In *Walker*, the EEG and fMRI acquisitions occur when “[t]wo auditory stimuli, a beep and the emotionally salient stimulus of the participant’s name, were administered.” Thus, external stimulation is provided to the brain. This can be disruptive for the person and his brain since the beep and emotionally salient stimulus evokes a response from the brain. This creates a burden on a person who has a malady or disorder in his brain.

In contrast, in the present invention, the examinee’s brain is analyzed “in a state without external stimuli” without imposing any task on the examinee from the outside. (Spec., Pg. 4). The present invention seeks to reduce the burden on the examinee, which is why, for example the patient is only asked to sleep rather than fulfill a certain task such as “watching a picture, listening to a sound, doing a finger exercise, [or] answering a question on words. . . .” (Spec., Pg. 1, 3). Without imposing any task on the examinee from the outside, the apparatus can reduce the burden on the examinee which can be helpful to those persons with a malady or disorder in their brains.

Furthermore, the Office Action admits that *Walker* does not disclose “taking a differential of a change in the MRI signal strength considered significant in view of the correlativity with the change in stage.” However, it is not obvious to take a differential of a change in the MRI signal strength considered significant in view of the correlativity with the change in stage. *Walker* is interested in determining the level of activation of each auditory stimulus. Thus, in *Walker*, if it were to calculate a differential for brain activity and there is no indication that it would be

obvious to do so, it would make sense to calculate a differential for brain activity in the NREM stage without auditory stimulus with the brain activity in the NREM stage with auditory stimulus to determine the level of activation. Likewise, a differential may be calculated between the brain activity in the wake stage without auditory stimuli to the brain activity in the wake stage with auditory stimuli to determine the level of activation. Thus, the brain activity in the same stage is compared based on whether an auditory stimuli or not is supplied to determine the level of activation.

In contrast, in the present invention, the brain functioning in two different stages are compared. (Spec., Pg. 11). For example, the function part location calculating means 3 specifies a part of the brain functioning in a state where a predetermined event is occurring by obtaining information on MRI signal strengths at each voxel where a predetermined event is occurring (e.g. in one of the sleeping stages) and where there is no predetermined event is occurring (e.g. in the waking stage). (Spec., Pg. 11).

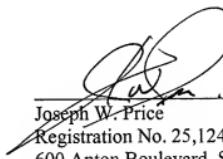
All arguments for patentability with respect to Claim 1 are repeated and incorporated herein for Claims 5, 6, and 11.

Claims 3-4, 7-10, and 12 depend from and further limit Claims 1, 6, and 11, and are allowable, too.

If the Examiner believes that a telephone interview will help further the prosecution of this case, he can contact the undersigned attorney at the listed telephone number.

Very truly yours,

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